

What is claimed is:

- 1        1.    An interconnect stage comprising:
  - 2            a. a vertical symmetry plane;
  - 3            b. a rotation axis substantially perpendicular to
  - 4            said symmetry plane;
  - 5            c. a conductive see-saw structure including:
    - 6                i. a substantially planar central portion
    - 7                horizontally extending around an
    - 8                intersection of said symmetry plane and
    - 9                said rotation axis;
    - 10              ii. a first peripheral arm laterally extending
    - 11              from said central portion along said
    - 12              symmetry plane and peripherally
    - 13              terminating in a first contact tip, said
    - 14              first arm pointing downwards in a first
    - 15              angle with respect to said planar central
    - 16              portion;
    - 17              iii. a second peripheral arm laterally
    - 18              extending from said central portion along
    - 19              said symmetry plane and peripherally
    - 20              terminating in a second contact tip, said
    - 21              second arm extending in opposing position
    - 22              and orientation to said first arm, said
    - 23              second arm pointing upwards in a second
    - 24              angle with respect to said planar central
    - 25              portion;
  - 26            d. a dielectric resilient means including:
    - 27                i. an interface portion combined with said
    - 28                central portion;

29           ii. two torsion features laterally extending  
30           from opposing ends of said interface  
31           portion along said rotation axis; and  
32       wherein said resilient means is configured to be  
33       peripherally fixed and configured such that a  
34       force induced onto at least one of said first  
35       contact tip and said second contact tip results  
36       in a rotational displacement of said see-saw  
37       structure around said rotation axis, said  
38       rotational displacement being opposed by a  
39       resiliently torsion deformation of said torsion  
40       features.

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1           2.    The interconnect stage of claim 1, wherein  
2           said see-saw structure is substantially  
3           symmetric with respect to said symmetry  
4           plane.

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1           3.    The interconnect stage of claim 1, wherein  
2           said resilient means is substantially  
3           symmetric with respect to said symmetry  
4           plane.

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1           4.    The interconnect stage of claim 1, wherein  
2           said see-saw structure is substantially  
3           symmetric with respect to said rotation  
4           axis.

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1           5.    The interconnect stage of claim 1, wherein  
2           said resilient means is substantially  
3           symmetric with respect to said rotation  
4           axis.

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6. The interconnect stage of claim 1, wherein  
said resilient means has a constant  
thickness.

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7. The interconnect stage of claim 1, wherein  
said see-saw structure has a constant  
thickness.

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8. The interconnect stage of claim 1, wherein  
said see-saw structure further features a  
slot propagating from at least one of said  
first contact tip and said second contact  
tip along said symmetry plane towards said  
rotation axis, wherein said slot  
conductively divides at least partially at  
least one of said first peripheral arm, said  
second peripheral arm and said central  
portion.

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9. The interconnect stage of claim 8,  
wherein said slot propagates between  
said first contact tip and said second  
contact tip dividing said see saw  
structure into at least two  
conductively separated entities.

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10. The interconnect stage of claim 1, wherein  
said interface portion occupies a fraction  
of said planar central portion such that a  
top and a bottom of said central portion are

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5 directly accessible in the vicinity of said  
6 peripheral arms.

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1 11. The interconnect stage of claim 1, wherein  
2 said interface portion has a first width  
3 substantially larger than a second width of  
4 said torsion feature such that a  
5 delamination origin between said central  
6 portion and said interface portion is in a  
7 larger distance to said rotation axis than a  
8 peak shear point of said dielectric  
9 resilient means.

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1 12. The interconnect stage of claim 1, wherein  
2 said resilient means further comprises a  
3 flex feature extending from at least one of  
4 said torsion features in direction  
5 substantially parallel to said symmetry  
6 plane in an offset to said see-saw structure  
7 such that said rotational displacement is  
8 additionally opposed by a resilient flexural  
9 deformation of said flex feature.

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1 13. The interconnect stage of claim 1, further  
2 comprising a stiffening structure combined  
3 with said interface portion on the opposite  
4 side of said planar center portion.

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1 14. An interconnect assembly comprising:  
2 a. a carrier frame including:  
3 i. a circumferential support frame;

- 4           ii. a dielectric carrier grid combined with
- 5           said circumferential support frame;
- 6       b .a number of two dimensionally arrayed
- 7       interconnect stages, at least one of said
- 8       interconnect stages comprising:
- 9           i. a vertical symmetry plane;
- 10          i i a rotation axis substantially
- 11          perpendicular to said symmetry plane:
- 12       iii. a conductive see-saw structure including:
- 13           1 a substantially planar central
- 14           portion horizontally extending around
- 15           an intersection of said symmetry
- 16           plane and said rotation axis;
- 17           2 .a first peripheral arm laterally
- 18           extending from said central portion
- 19           along said symmetry plane and
- 20           peripherally terminating in a first
- 21           contact tip, said first arm pointing
- 22           downwards in a first angle with
- 23           respect to said planar central
- 24           portion;
- 25           3 .a second peripheral arm laterally
- 26           extending from said central portion
- 27           along said symmetry plane and
- 28           peripherally terminating in a second
- 29           contact tip, said second arm
- 30           extending in opposing position and
- 31           orientation to said first arm, said
- 32           second arm pointing upwards in a
- 33           second angle with respect to said
- 34           planar central portion;

iv. a dielectric resilient means combined with  
said carrier grid, said dielectric  
resilient means including:

1. an interface portion combined with  
said central portion;

2. two torsion features laterally  
extending from opposing ends of said  
interface portion along said rotation  
axis; and

wherein said resilient means is configured such  
that a force induced onto at least one of said  
first contact tip and said second contact tip  
results in a rotational displacement of said see-  
saw structure around said rotation axis, said  
rotational displacement being opposed by a  
resilient torsion deformation of said torsion  
features.

15. The interconnect assembly of claim 14,  
wherein said see-saw structure is  
substantially symmetric with respect to said  
symmetry plane.

16. The interconnect assembly of claim 14,  
wherein said resilient means is  
substantially symmetric with respect to said  
symmetry plane.

17. The interconnect assembly of claim 14,  
wherein said see-saw structure is  
substantially symmetric with respect to said  
rotation axis.

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18. The interconnect assembly of claim 14,  
wherein said resilient means is  
substantially symmetric with respect to said  
rotation axis.

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19. The interconnect assembly of claim 14,  
wherein said resilient means has a constant  
thickness.

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20. The interconnect assembly of claim 14,  
wherein said see-saw structure has a  
constant thickness.

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21. The interconnect assembly of claim 14,  
wherein said see-saw structure further  
features a slot propagating from at least  
one of said first contact tip and said  
second contact tip along said symmetry plane  
towards said rotation axis, wherein said  
slot conductively divides at least partially  
at least one of said first peripheral arm,  
said second peripheral arm and said central  
portion.

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22. The interconnect assembly of claim 21,  
wherein said slot propagates between  
said first contact tip and said second  
contact tip dividing said see saw  
structure into at least two  
conductively separated entities.

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1           23. The interconnect assembly of claim 14,  
2           wherein said interface portion occupies a  
3           fraction of said planar central portion such  
4           that a top and a bottom of said central  
5           portion are directly accessible in the  
6           vicinity of said peripheral arms.

1           24. The interconnect assembly of claim 14,  
2           wherein said interface portion has a first  
3           width substantially larger than a second  
4           width of said torsion feature such that a  
5           delamination origin between said central  
6           portion and said interface portion is in a  
7           larger distance to said rotation axis than a  
8           peak shear point of said dielectric  
9           resilient means.

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1           25. The interconnect assembly of claim 14,  
2           wherein said torsion features of each of  
3           said number of interconnect stages are fixed  
4           at and protruding from x-oriented grid  
5           members of said carrier grid.

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1           26. The interconnect assembly of claim 14,  
2           wherein said torsion features and said  
3           interface feature of each of said number of  
4           interconnect stages define y-oriented grid  
5           members of said carrier grid.

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1           27. The interconnect assembly of claim 14,  
2           wherein said resilient means further  
3           comprises a flex feature extending from at



4           least one of said torsion features in  
5           direction substantially parallel to said  
6           symmetry plane in an offset to said see-saw  
7           structure such that said rotational  
8           displacement is additionally opposed by a  
9           resilient flexural deformation of said flex  
10          feature.

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1           28. The interconnect assembly of claim 27,  
2           wherein said flex feature is part of an  
3           x-oriented grid member of said carrier  
4           grid.

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1           29. The interconnect assembly of claim 27,  
2           wherein an x-oriented grid member of  
3           said carrier grid is defined by a  
4           number of said flex feature of each of  
5           said number of interconnect stages.

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1           30. The interconnect assembly of claim 14,  
2           further comprising a stiffening structure  
3           combined with said interface portion on the  
4           opposite side of said planar center portion.

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1           31. The interconnect assembly of claim 14 being  
2           part of a test apparatus for repetitively  
3           receiving and testing a circuit chip,  
4           wherein said first second contact tip of at  
5           least one of said number of interconnect  
6           stages is contacting a first contact of said  
7           test apparatus and wherein said second  
8           contact tip of at least one of said number

9 of interconnect stages is contacting a  
10 second contact of said circuit chip.  
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1 32. The interconnect assembly of claim 14  
2 fabricated by a method including the steps  
3 of:

- 4 a. conductively combined planar shaping of  
5 a number of said see-saw structure;
- 6 b. fabricating said carrier frame;
- 7 c. combining said number of said  
8 conductively combined and planar shaped  
9 see-saw structures with said carrier  
10 frame;
- 11 d. electro plating said number of  
12 conductively combined and planar shaped  
13 see-saw structures and consecutively  
14 releasing said number of said planar  
15 shaped see-saw structures; and
- 16 e. 3D forming said number of said released  
17 planar shaped see-saw structures.